

A STUDY TO ESTIMATE SALMONID SURVIVAL THROUGH THE COLUMBIA RIVER ESTUARY USING ACOUSTIC TAGS, MOBILE TRACKING EFFORTS

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ABSTRACT

Deteriorating survival estimates for Chinook salmon migrating through the lower Columbia River have prompted fate determination efforts to reveal specific areas where mortality occurs. To aid in this work, a vessel-mounted tracking unit was used to provide real-time, three-dimensional vectors (range, bearing, and depth) for smolt targets implanted with Juvenile Salmon Acoustic Telemetry System (JSATS) tags. Based on conclusions reached using stationary arrays in 2007, mobile tracking in 2008 was concentrated in the estuary from Tenasillahe (river kilometer, Rkm, 62) through the primary array location at Rkm 8.3.

Nearly 300 tracks were recorded for free ranging JSATS-tagged fish in the lower river and estuary. Of these, 253 tracks, varying from several meters to over 5 km in length, were recorded for unique targets. Another 7 targets were identified as stationary on the river bottom, confirmed on successive dates by repeated visits to a given site at least 24 h following initial contact, and by depth sounder readings. Unlike similar data from 2007, these stationary targets were widely distributed on both north and south migration corridors of the estuary. Mobile targets displayed two distinct track types. The more normal behavior, evinced by approximately 99% of tracked individuals, was essentially fixed downstream movement indicative of directed emigration.

During both yearling and subyearling Chinook salmon outmigration periods, a substantial portion of targets were tracked moving through the north channel along the Washington State shoreline from Portuguese Point (Rkm 29.3) to Point Elise Rkm (20.5). Several targets from both groups were also tracked entering Baker Bay between East and West Sand Islands (Rkm 8), particularly during flood tide events.